

1. Work requester fills out this section.

☐ Standing Work Permit

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|--|----------------|----------------------|---------------------------|
| Requester: Don Lynch | Date: 01/19/06 | Ext.: 2253 | Dept/Div/Group: PO/PHENIX |
| Other Contact person (if different from requester): S. Marino | | | Ext.: 3704 |
| Work Control Coordinator: Don Lynch | | Start Date: 01/20/06 | Est. End Date: 02/03/06 |
| Brief Description of Work: Repair/replace failed DC west FEM modules and remove broken wires from DC | | | |
| Building: 1008 | Room: IR | Equipment: n/a | Service Provider: PHENIX |

2. WCC, Requester/Designee, Service Provider, and ES&H (as necessary) fill out this section or attach analysis

| | | | | | |
|---|--|---|--|---|--|
| ES&H ANALYSIS | | | | | |
| Radiation Concerns | | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Activation | <input type="checkbox"/> Airborne | <input type="checkbox"/> Contamination |
| Radiation Generating Devices: | | <input type="checkbox"/> Radiography | <input type="checkbox"/> Moisture Density Gauges | <input type="checkbox"/> Soil Density Gauges | <input type="checkbox"/> X-ray Equipment |
| <input type="checkbox"/> Special nuclear materials involved, notify Isotope Special Materials Group | | | <input type="checkbox"/> Fissionable materials involved, notify Laboratory Criticality Officer | | |
| Safety Concerns | | <input type="checkbox"/> None | <input type="checkbox"/> Ergonomics | <input type="checkbox"/> Transport of Haz/Rad Material | |
| <input type="checkbox"/> Adding/Removing Walls or Roofs | <input type="checkbox"/> Confined Space* | <input type="checkbox"/> Explosives | <input type="checkbox"/> Lead* | <input type="checkbox"/> Penetrating Fire Walls | |
| | <input type="checkbox"/> Corrosive | <input type="checkbox"/> Flammable | <input type="checkbox"/> Magnetic Field* | <input type="checkbox"/> Pressurized Systems | |
| <input type="checkbox"/> Asbestos* | <input type="checkbox"/> Cryogenic | <input type="checkbox"/> Fumes/Mist/Dust* | <input type="checkbox"/> Material Handling | <input type="checkbox"/> Rigging/Critical Lift | |
| <input type="checkbox"/> Beryllium* | <input type="checkbox"/> Electrical | <input type="checkbox"/> Heat/Cold Stress | <input type="checkbox"/> Noise* | <input type="checkbox"/> Toxic Materials* | |
| <input type="checkbox"/> Biohazard* | <input checked="" type="checkbox"/> Elevated Work* | <input type="checkbox"/> Hydraulic | <input type="checkbox"/> Non-ionizing Radiation* | <input type="checkbox"/> Vacuum | |
| <input type="checkbox"/> Chemicals* | <input type="checkbox"/> Excavation | <input type="checkbox"/> Lasers* | <input type="checkbox"/> Oxygen Deficiency* | <input type="checkbox"/> Other | |
| * Does this work require medical clearance or surveillance from the Occupational Medicine Clinic? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | | | | | |
| Environmental Concerns | | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Work impacts Environmental Permit No. | | |
| <input type="checkbox"/> Atmospheric Discharges (rad/non-rad) | <input type="checkbox"/> Land Use | <input type="checkbox"/> Soil Activation/contamination | <input type="checkbox"/> Waste-Mixed | | |
| <input type="checkbox"/> Chemical or Rad Material Storage or Use | <input type="checkbox"/> Liquid Discharges | <input type="checkbox"/> Waste-Clean | <input type="checkbox"/> Waste-Radioactive | | |
| <input type="checkbox"/> Cesspools (UIC) | <input type="checkbox"/> Oil/PCB Management | <input type="checkbox"/> Waste-Hazardous | <input type="checkbox"/> Waste-Regulated Medical | | |
| <input type="checkbox"/> High water/power consumption | <input type="checkbox"/> Spill potential | <input type="checkbox"/> Waste-Industrial | <input type="checkbox"/> Underground Duct/Piping | | |
| Waste disposition by: | | <input type="checkbox"/> Other | | | |
| Pollution Prevention (P2)/Waste Minimization Opportunity: | | <input checked="" type="checkbox"/> None <input type="checkbox"/> Yes | | | |
| FACILITY CONCERNS | | <input checked="" type="checkbox"/> None | | | |
| <input type="checkbox"/> Access/Egress Limitations | <input type="checkbox"/> Electrical Noise | <input type="checkbox"/> Potential to Cause a False Alarm | | <input type="checkbox"/> Vibrations | |
| | <input type="checkbox"/> Impacts Facility Use Agreement | | <input type="checkbox"/> Temperature Change | <input type="checkbox"/> Other | |
| <input type="checkbox"/> Configuration Control | <input type="checkbox"/> Maintenance Work on Ventilation Systems | | <input type="checkbox"/> Utility Interruptions | | |
| WORK CONTROLS | | | | | |
| Work Practices | | | | | |
| <input type="checkbox"/> None | <input type="checkbox"/> Exhaust Ventilation | <input checked="" type="checkbox"/> Lockout/Tagout | <input type="checkbox"/> Spill Containment | <input type="checkbox"/> Security (see Instruction Sheet) | |
| <input checked="" type="checkbox"/> Back-up Person/Watch | <input type="checkbox"/> HP Coverage | <input type="checkbox"/> Posting/Warning Signs | <input type="checkbox"/> Time Limitation | <input type="checkbox"/> Other | |
| <input type="checkbox"/> Barricades | <input type="checkbox"/> IH Survey | <input type="checkbox"/> Scaffolding-requires inspection | <input type="checkbox"/> Warning Alarm (i.e. "high level") | | |
| Protective Equipment | | | | | |
| <input type="checkbox"/> None | <input type="checkbox"/> Ear Plugs | <input type="checkbox"/> Gloves | <input type="checkbox"/> Lab Coat | <input type="checkbox"/> Safety Glasses | |
| <input type="checkbox"/> Coveralls | <input type="checkbox"/> Ear Muffs | <input type="checkbox"/> Goggles | <input type="checkbox"/> Respirator | <input checked="" type="checkbox"/> Safety Harness | |
| <input type="checkbox"/> Disposable Clothing | <input type="checkbox"/> Face Shield | <input type="checkbox"/> Hard Hat | <input type="checkbox"/> Shoe Covers | <input checked="" type="checkbox"/> Safety Shoes | <input type="checkbox"/> Other |
| Permits Required (Permits must be valid when job is scheduled.) | | | | | |
| <input checked="" type="checkbox"/> None | <input type="checkbox"/> Cutting/Welding | <input type="checkbox"/> Impair Fire Protection Systems | | | |
| <input type="checkbox"/> Concrete/Masonry Penetration | <input type="checkbox"/> Digging/Core Drilling | <input type="checkbox"/> Rad Work Permit-RWP No | | | |
| <input type="checkbox"/> Confined Space Entry | <input type="checkbox"/> Electrical Working Hot | <input type="checkbox"/> Other | | | |
| Dosimetry/Monitoring | | | | | |
| <input checked="" type="checkbox"/> None | <input type="checkbox"/> Heat Stress Monitor | <input type="checkbox"/> Real Time Monitor | <input type="checkbox"/> TLD | | |
| <input type="checkbox"/> Air Effluent | <input type="checkbox"/> Noise Survey/Dosimeter | <input type="checkbox"/> Self-reading Pencil Dosimeter | <input type="checkbox"/> Waste Characterization | | |
| <input type="checkbox"/> Ground Water | <input type="checkbox"/> O ₂ /Combustible Gas | <input type="checkbox"/> Self-reading Digital Dosimeter | <input type="checkbox"/> Other | | |
| <input type="checkbox"/> Liquid Effluent | <input type="checkbox"/> Passive Vapor Monitor | <input type="checkbox"/> Sorbent Tube/Filter Pump | | | |
| Training Requirements (List below specific training requirements) | | | | | |
| PHENIX Awareness, LockOut/TagOut affected, RHIC Access, working at heights | | | | | |
| Based on analysis above, the Walkdown Team determines the risk, complexity, and coordination ratings below: | | | If using the permit when all hazard ratings are low, only the following need to sign: (Although allowed, there is no need to use back of form) | | |
| ES&H Risk Level: | <input checked="" type="checkbox"/> Low | <input type="checkbox"/> Moderate | <input type="checkbox"/> High | WCC: | Date: |
| Complexity Level: | <input checked="" type="checkbox"/> Low | <input type="checkbox"/> Moderate | <input type="checkbox"/> High | Service Provider: | Date: |
| Work Coordination: | <input type="checkbox"/> Low | <input checked="" type="checkbox"/> Moderate | <input type="checkbox"/> High | Authorization to start | Date: |
| (Departmental Sup/WCC/Designee) | | | | | |

3. Both work requester and service provider contribute to work plan (use attachments for detailed plans)

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|--|---|------------------|--|-------------|
| Work Plan (procedures, timing, equipment, and personnel availability need to be addressed): See Attached | | | | |
| Special Working Conditions Required: No | | | | |
| Operational Limits Imposed: No | | | | |
| Post Work Testing Required: No | | | | |
| Job Safety Analysis Required: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | | | Walkdown Required: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | |
| Reviewed by: Primary Reviewer will determine the size of the review team and the other signatures required based on hazards and job complexity. Primary Reviewer signature means that the hazards and risks that could impact ES&H have been identified and will be controlled according to BNL requirements. | | | | |
| Title | Name (print) | Signature | Life # | Date |
| Primary Reviewer | | | | |
| ES&H Professional | | | | |
| Other | | | | |
| Other | | | | |
| Work Control Coordinator | Don Lynch | | 20146 | 1/20/06 |
| Service Provider | | | | |
| | Review Done: <input type="checkbox"/> in series <input type="checkbox"/> team | | | |

4. Job site personnel fill out this section.

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|---|--------|------------------------|--------|
| Note: Signature indicates personnel performing work have read and understand the hazards and permit requirements (including any attachments). | | | |
| Job Supervisor: | | Contractor Supervisor: | |
| Workers: | Life#: | Workers : | Life#: |
| | | | |
| | | | |
| | | | |
| Workers are encouraged to provide feedback on ES&H concerns or on ideas for improved job work flow. Use feedback form or space below. | | | |

5. Departmental Job Supervisor, Work Control Coordinator/Designee

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|---|------------|--------|-------|
| Conditions are appropriate to start work: (Permit has been reviewed, work controls are in place and site is ready for job.) | | | |
| Name: | Signature: | Life#: | Date: |

6. Departmental Job Supervisor, Work Requester/Designee determines if Post Job Review is required. ☐ Yes ☐ No

| | | | |
|--|------------|--------|-------|
| Post Job Review (Fill in names of reviewers) | | | |
| Name: | Signature: | Life#: | Date: |
| Name: | Signature: | Life#: | Date: |

7. Worker provides feedback.

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|--|--|
| Worker Feedback (use attached sheets as necessary) | |
| a) WCM/WCC: Is any feedback required? <input type="checkbox"/> Yes <input type="checkbox"/> No | |
| b) Workers: Are there better methods or safer ways to perform this job in the future? <input type="checkbox"/> Yes <input type="checkbox"/> No | |

8. Closeout: Work Control Coordinator (authorizing dept.) checks quality of completed permit and ensures the work site is left in an acceptable condition. (WCC can delegate clean up of work area to work supervisor)

| | | | |
|-----------|------------|--------|-------|
| Name: | Signature: | Life#: | Date: |
| Comments: | | | |

Drift Chamber repair in the PHENIX Experimental Hall (bldg. 1008).**Problem**

The FEM power supply modules on the west Drift require maintenance prior to Run 6 to repair or replace a couple of failed modules and to remove 2 broken wires that need to be removed to repair 2 HV short to ground conditions in the west drift chamber. Access to the installed location of the FEM modules is difficult, as they are located 10 to 20 feet above track level, tucked inside the arc formed by the RICH detector, with the Central Magnet in front of the west carriage. The procedure developed below was used successfully in the past to remove quite a few failed modules. (Note the broken wires can be accessed from the CM scissor lift platform which is protected by railings and therefore does not require any additional fall protection.)

Work Plan

This work is to be done by fully trained and experienced personnel prior to start of flammable gas flow in the IR. Access to the power supply modules is by extension ladders set up between the central magnet (CM) outrigger and the RICH vessel on the west carriage. For the higher modules, two ladders will be secured side-by-side, tied together, to allow climbing by the CM pole piece. No detectors in the IR will contain flammable gas during this operation. The Drift Chamber high and low voltage will be turned off. The 12-ton building crane will be positioned such to place the eye of a sling directly above the work area, then locked out. A harness will be worn and clipped to the sling while the work is being performed. A watch must be present at all times when someone is up on the ladders. All work in the IR will be supervised by Sal Marino.

Work will involve trouble shooting of the modules, and repair or replacement as appropriate.

- Ensure that power to the DC electronics is secured and that the CM power key is locked out of use.
- Erect and secure 1 (or 2 side by side if necessary) extension ladders between the top of the central magnet outrigger and the rich detector.
- Set up a tie off point just above the working position using the building crane and an adequately rated sling.
- The position of the tie off point is to be set for each working level and the crane must be locked out before the worker ascends the ladder.
- The worker is to use a body harness with an appropriately rated short retractable fall arresting lanyard and tie off before starting work.
- A watch must be present at all times when a person is on the ladders
- Remove or reinstall power supply modules as necessary.

